

THE GREEN CALDRON

A MAGAZINE OF FRESHMAN WRITING



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Technocracy in Action

ANONYMOUS
Rhetoric 101, Theme 8

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS met last evening in an unprecedented and unannounced midnight session in the main office of the Electrical Engineering Building. Although the meeting was held in great secrecy, with the press, radio, and television excluded, a usually reliable source is credited with the statement that a sweeping overhaul of the campus as we now know it is contemplated. Due to severe crowding in both housing and classrooms, caused by the tremendous influx of hundreds of aspiring young engineers and other students, it has been decided that henceforth the main college campus will be run exclusively as a highly efficient technical school. All of the functions of the colleges of Commerce, Education, Law, and related fields will be drastically reduced in size and scope and relegated to new locations.

Main headquarters for the non-technical schools will be located in the PGU Canteen, and their lesser offices in the adjoining mail shack. The numerous buildings now housing the many independent students in the PGU will be renovated and used for classrooms. From the maintenance staff comes the assurance that the units can be ready by next fall and that little discomfort will be experienced, since most of the holes in the tarpaper sheathing have been covered with masking tape. A new color scheme is in the planning stage, with beautiful pastels predominant; the decorating is to be done as a credit course for the advanced students in the College of Fine and Applied Arts.

As for housing, always a problem, it is known that a new section of permanently temporary housing will be located in the area behind Memorial Stadium. This housing will be constructed as rapidly as possible, with most of it scheduled for completion by the middle of the second semester of 1958. Until then, large numbers of students will be housed on temporary cots in the Armory, Ice Rink, and, during the early fall, in the Stadium itself.

Cuts in the staffs necessitated by reduction of the lesser schools of the University will be handled in the following fashion: A strict seniority rule will apply except in cases where the employee can demonstrate a definite need for the money. The remaining instructors will be absorbed into the engineering school if they show enough aptitude and can be adapted to the vigorous pace set by the demand of industry for more and more engineers. It is felt that nearly fifty per cent of the non-technical teachers will respond favorably to re-training. It is envisioned that the most trouble will be encountered in the ranks of the rhetoric teachers. However, many of these people show great talent and ability for writing and composition, and they

will doubtless be put to the task of editing and revising the ever-changing technical manuals and publications.

Since the re-trained teachers will not completely fill the needs of the engineering colleges, many instructors will be recruited from the faculty ranks of the leading universities of the nation. Raiding is not to be tolerated, but many lucrative offers will be made to sway large numbers of top-notch educators to come to Illinois. As one wag put it, "If football players can be paid to play, teachers can be paid to teach."

The reshuffle, with the entire campus dedicated to the engineering curriculum in general and to the Electrical Engineering curriculum in particular, will be a technician's dream. All of the latest electronic equipment is to be purchased, or manufactured right here in the engineering labs. It is felt that this will spur enrollments even more and make this institution a mecca for technological learning.

Many rapid advancements are expected in all fields when this school is well under way. A top-secret mock-up has already been built of a revolutionary, automatic slide rule. The consensus on the north side of Green Street is that this development alone will save countless man-hours for both students and staff. It is even hoped that some of the students and staff may be formally introduced to each other before the end of a given semester. Top priority is also given to the designing of a collapsible T-square that will fit into those little green tackle boxes so prevalent on the campus.

Plans are also under way to turn the Illini Union Building into a sort of super-lounge equipped with all of the latest time-savers and conveniences in vogue. Intravenous feeding will be available in the Commons for the slower students who do not have the time to eat a more leisurely meal. This will enable the poorer student to assimilate both knowledge and sustenance at the same time. Television sets monitoring all of the educational channels will be provided to give relaxation and learning in a dual dose. Revolving doors will be installed in such a manner as to provide a more direct short-cut for the run between the engineering buildings and Lincoln Hall and points beyond. The nominal seven-dollar service charge may have to be raised, but it is felt that the increased efficiency will more than compensate the student.

With all of these changes in effect, the engineering student at the University of Illinois will be a match for any in the nation. The signs point to a birth of real learning at our University, with practical technical courses the order of the day. It will be an engineering democracy in action, a technocracy of the first water. The motto will be "The U of I for EE." We wish them well.

Mass-Produced Mental Midgets

SANDERS R. DOLCE
Rhetoric 102, Theme 6

AT A TIME WHEN SHE NEEDS WELL-DEVELOPED MINDS as never before, the United States finds that she is being presented with a host of mentally bankrupt citizens. That the mental quality of today's younger citizens is not as high as it could or should be, is something I will not try to prove. This fact has been amply proven in many places and in many ways. If you desire proof, however, consult the Director of Admissions of any American university. I am sure that you will find this proof. In this paper, I shall try to give reasons for this sad state of affairs, and I shall try to recommend a cure for our national educational ailments.

First of all, what has caused this depression of national intelligence? I believe that the cause is a warped view of democracy. "The powers that be" in education are trying to give all Americans an equal opportunity to be educated. This is a commendable attitude. At least, it is commendable up to a certain point, but that point has been passed. It has not only been passed, but I believe it has been forgotten. At any rate, it has been forgotten by those who are in a position to do something to correct an already intolerable situation. The current fad in education is to educate all students equally regardless of their capability to learn. This fad teaches that it is a social wrong to give special educational opportunities to students with special capabilities because it is undemocratic to do so. Thus we find that students with poor mentalities are mechanically passed from grade to grade along with those who are of above-average intelligence. This practice is putting mental shackles on the intelligent students for the sake of maintaining the sham of educational democracy. The educators responsible for the mental inadequacy of today's students further believe that if an incapable student is failed in a course, he will develop neuroses and psychoses from being placed with a younger age group. This may be true, but what is the sense of promoting a student because he has physically grown a year older when he has not matched that year's physical growth with a year's mental growth?

The aforesaid educational practices do to scholastic incentive what socialism does to business incentive. These practices are obliterating scholastic incentive. First of all, students who hunger for knowledge are held back because the class mental activity level is brought down by the poor students. This low-level education all too often causes the bright students to twiddle their mental thumbs for lack of mental stimulation. I believe that in this manner we are allowing a great many good brains to become stagnated. The average students see that, since they will pass anyway, there is no sense in extending themselves. In time they forget how to extend themselves—how to think. The poor students who don't know what is going on in the third grade

certainly will not know any more in fourth grade, and sitting in a class with mental superiors can prove a good deal more frustrating than sitting in a class with younger classmates.

A by-product of the current trend in education is the all-too-prevalent student attitude that it is smart to be dumb. It is not at all uncommon to hear a student brag that he hasn't studied for an exam, or that he doesn't know a thing about a course he's taking. It has actually come to the point where a student can become a social outcast by getting good grades. He is labeled "brain" and isolated. This attitude is both discouraging and disgusting.

What can be done about all this? That is a good question, and it deserves a good answer. I believe that I have that answer. The right of a teacher to fail a student without fear of parental reprisal must be reinstated. Furthermore, teachers must have the right to double-promote a student whose intelligence warrants such a promotion. Once students find out that they can be failed and double-promoted, certain changes will become manifest. For one thing, the poor student will no longer slow down the rest of his class. He will find himself in a sink-or-swim situation, and I am sure that educators will be surprised at how many poor students will learn to swim. Secondly, the average student will realize that it is no longer smart to be lazy. When faced with the possibility of failure, I am sure that many average students will suddenly become above-average students. As for those students who will be our nation's future mental wealth, they will no longer be bound to the mediocrity of a class level. Incentive will no longer be a forgotten thing among students, once they discover that promotion does not come automatically. Students will become what the name implies: they will study.

These suggestions are not complete solutions to the complex problem of education, but I believe that no other pair of educational reforms could do as much to raise the intelligence level of our youth as the two I have suggested. I hope that someone who feels as I do can make his voice heard, and that this someone can turn the tide back to sane education and away from low-quality, mass mentality.

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The Average Teacher

LAWRENCE MARTLING

Rhetoric 100, Theme 4

YOU MAY NOT BELIEVE IT, BUT MOST TEACHERS ARE human. You say you never knew that? You are very misinformed.

One of the things that gets me about the average teacher is the fact that while he always expects you to be on time and ready for work, seldom is he there on time and usually it takes him a while to forget that "38-25-38" blonde

he had lunch with and get down to work. Most people look up to the teacher as the model of dignity, grace, and learning. On the contrary, I find teachers very undignified, certainly not graceful, and generally stupid. Of course, there are exceptions, but they are few and far between.

The average teacher talks when you are trying to work, butts in on the conversation, and may be a general pest. He is late for engagements by at least fifteen minutes, always talks in a loud voice except when you are trying to hear him, hates Saturday classes, and never can find anything in that desk drawer. They always say that the inside of a woman's purse is like the city dump; well, the same applies to teachers' desk drawers.

Most people mellow as they get older, but not a teacher. Instead, he gets irritable and fussy. He generally wears glasses and always plays with them when you are trying to concentrate on what he might be saying. He complains loud and long about your writing, but you can never read his when he marks that beautiful paper of yours. He loves conversation only when he does all the talking, never obeys the rules, and always forgets to bring some important item to class.

In spite of all this, he manages to hold a fairly well-paid job while loudly complaining about the wages. Generally he fits into the "nice guy" class, but not always. Now after all this, I wonder why we sometimes actually get to like him.

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Why I Chose Teaching

MARTHA ANN GRAVES

Placement Test Theme

THERE ARE MANY REASONS WHY I HAVE CHOSEN KINDERGARTEN teaching as my career. Each reason has a special significance to both me and my country.

Today, more elementary education teachers are needed in this country than at any other time during the history of our nation. Many persons tend to overlook the importance of elementary education to their children. They are content to place their youngsters in overcrowded schools under the guidance of overworked teachers. To some, elementary education means only a playschool for youngsters. Other parents take a more penetrating look. They see the true importance of primary education. They realize the need their children have for a good beginning in education. This need is one of the first reasons why I have chosen teaching as my career.

A child's first contact with school is usually his most important one. In kindergarten he forms his first attitudes toward school. These attitudes, whether good or bad, vitally affect his educational career. When I become a

teacher, I want to be certain that my pupils' first contact with schooling is a pleasant, interesting one. I want them to have a good attitude toward the teaching profession in general. I hope to bring about this good attitude by gaining their respect, confidence, and sincere affection. I feel that kindergarten teaching will give me an opportunity to teach good attitudes and principles to pupils whose minds are flexible and easily trained.

Some of the reasons for my choice of primary education as my occupation are thoroughly practical. A career in this field is usually fairly rewarding for women, financially and otherwise. The salary paid most women teachers is usually adequate for a good standard of living. Also to be considered are the short hours and long summer vacations. However, practical reasons were not the main ones which helped me make my career decision.

My own contacts with good teachers have helped me to make my choice. A fine teacher is respected and admired by her community. She has the true admiration and respect of the students, as well as of their parents. To her, educating children is a satisfying and rewarding experience. I would like to be that kind of teacher.

The culmination of my desire to be a teacher came last fall when I began to assist the teacher in our church kindergarten. In only a short time, I began to feel a sincere affection for the members of the class. Still more important, they seemed to like me, too. I found this work was varied and thoroughly to my liking. Pulling a loose baby tooth was only one of my important duties.

The church kindergarten teacher gained my immediate respect. She has a master's degree in elementary education and is one of the finest teachers I have met. She urged me to make elementary education my career. She was a vital factor in determining my decision.

These are the reasons for my educational choice. Through diligence in my studies, I hope to attain my goal.

CK

Why Should One Read?

QUENDRED WUTZKE CARPENTER

Rhetoric 102, Final Theme

IN ORDER FOR ANY SOCIETY TO SURVIVE BEYOND THE adult generation which controls it, that generation must transmit to its children the desire and the ability to maintain such a society. This process of socialization takes many forms, including some as subtle as the teasing of neighborhood children and some as obvious as our Constitution. In fact, every experience a person has can be considered a mold, helping to shape one's character and to influence one's actions—and a society *is* what its members *do* or don't do.

The essay, "Aimlessness in Education," by Arthur Bestor, describes the American society as one in which, ideally, each individual member or citizen exercises sufficient intellectual power to insure individual well-being, security, and *freedom*. He quotes Thomas Jefferson to stress the point that individual and therefore national freedom is not possible without this individual intellectual power—that is, education. He goes further to say that this American society is growing more and more advanced scientifically, so that the individual finds himself with the power to decide, and the duty to decide intelligently, matters of increasing complexity about which he cannot have been specifically educated. What is important, then, is good judgment, and according to Bestor our schools must, in educating the younger generation, develop this trait.

In the eyes of the younger generation, though, what sort of picture does our society present? Jobs are plentiful. For the high school student, the temptation is great to follow the example of many colleagues and forego college, even high school graduation, to take advantage of the opportunity to earn wages. The attitude is manifested in such remarks as "Well, even if I had gone to college, I couldn't have made more money than I am now making." And as for individual power, a student begins to scorn the idea as naïve, after seeing his neighbors, or even his own parents, continually neglect to vote and show no concern about it, explaining that their vote "doesn't count anyway." Such a highly specialized society as ours, with technical problems increasing every day, depends, more than has any other since history began, upon books to keep the civilization alive. In school, youngsters are supposed to be taught to read, to *want* to read, and to understand these valuable books. Yet, in actuality, society gives one an ever-decreasing incentive to read. Students who prefer an occasional non-fictional, informative book to a novel are all too often considered "odd" by their classmates; indeed, for a youngster to pick up any reading material of his own volition, when the television set is on in the next room, or a baseball game is starting, is to run the risk of wearing the brand of "bookworm." Something in our society has conditioned children to react in this way. Something has conditioned our society to make empty the words, "our citizens must be intellectually strong," by the widespread indifference and neglect of the very things which build intellectual strength.

If our society is to slip into one in which knowledge is centrally held by the aristocracy of an educated few, we have only to stop reading. Then, perhaps, either George Orwell's or Aldous Huxley's future society will actually take its place.

Why should one read? Not necessarily to make more money, and not necessarily to learn a new and trivial, but interesting fact. One should read, and read widely, with an open mind, to strengthen individual well-being, security, and freedom before, through selfish indifference, they are lost.

Concerning Crime and Punishment

STEPHEN P. THOMAS
Rhetoric 102, Theme 10

. . . there are certain persons who can . . . that is, not precisely are able to, but have a perfect right to commit breaches of morality and crimes, and that the law is not for them.¹

And with an axe, the destitute student, Raskolnikov, bludgeoned and robbed Alyona Ivanovna, an affluent, aged usurer whose money seemed destined never to be of any use to society. Raskolnikov murdered to test a theory. In his own words:

I maintain that if the discoveries of Kepler and Newton could not have been made known except by sacrificing the lives of one, a dozen, a hundred or more men, Newton would have had the right, would indeed have been in duty bound . . . to eliminate the dozen or the hundred men for the sake of making his discoveries known to the whole of humanity. I maintain that all great men . . . must from their very nature be criminals—more or less, of course. I believe . . . that men are in general divided by a law of nature into two categories, inferior (ordinary), that is, so to say, material that serves only to reproduce its kind, and men who have the gift or the talent to utter a new word.²

Raskolnikov did not know into which category he fitted. He murdered the pawnbroker to find the answer. From the second that the axe split Alyona Ivanovna's skull, the reader knows what Raskolnikov is, but not until much later does the answer become apparent to Raskolnikov himself. Immediately following the murder, Raskolnikov became extremely ill. Half recovered, he took what little money he had stolen and hid it under a stone, never to lay eyes on it again. Summoned to the police station because he was several months delinquent with his rent, Raskolnikov fainted when the murder was only casually mentioned. Is this the manner in which a Napoleon would have acted?

Later Raskolnikov comes to realize that he murdered, not, as it appeared, because he wanted to further his education with the stolen money, but for a much more subtle reason. In a discourse with Sonia, his lover, Raskolnikov states:

If I'd simply killed because I was hungry, I should be happy now. I wanted to become a Napoleon, that is why I killed her. I wanted to have the daring . . . and I killed her. I wanted to find out then and quickly whether I was a louse like everybody else or a man.³

¹ Fyodor Dostoyevsky, *Crime and Punishment*, trans. by Constance Garnett (New York: Random House, 1950), p. 254.

² *Ibid.*, pp. 254-55.

³ *Ibid.*, pp. 402-407.

And then Raskolnikov reveals to Sonia that the mental torture he went through after the murder proved that he was not a superior being.

If I were not a louse, should I have come to you? I murdered myself, not her!⁴

Raskolnikov realized that his theory was wrong. That no man has the right to judge who shall live and who shall not live. And that one human, alive now, is more important than a million good deeds planned for the future. Raskolnikov accepted the Christian conception that each human life is something created in the image of God, and that to destroy a life is to destroy one's own humanity. Finally having seen his wrong, then, Raskolnikov walked into the police office, summoned the chief officer, and confessed, "It was I killed the old pawnbroker woman and her sister Lizaveta with an axe and robbed them."⁵

⁴ *Ibid.*, p. 407.

⁵ *Ibid.*, p. 515.

etX

Lady Sings the Blues

—by Billie Holiday with William Dufty

JOANNE RUCK

Rhetoric 101, Book Report

"I've been told that nobody sings the word 'hunger' like I do. Or the word 'love.' Maybe I remember what those words are all about. Maybe I'm proud enough to want to remember Baltimore and Welfare Island, the Catholic institution, and the Jefferson Market Court, the sheriff in front of our place in Harlem and the towns from coast to coast where I got my lumps and scars . . . all the Cadillacs and minks in the world—and I've had a few—can't make it up or make me forget it."

"Sure I can sing," she told the owner of a small bistro in Harlem. The threat of eviction from the tiny apartment she called home had forced the fifteen-year-old girl to look for any kind of job that would keep her and her mother off the street. Desperate, she auditioned as a dancer in one of the dozens of small clubs that flourished in New York City during the 1920's. She was not a dancer, and the owner nearly laughed out loud at her endeavors to trip the light fantastic. But something about the strikingly beautiful girl must have touched him, and he asked her if she could sing.

"Sure I can sing. What good is that?" She had been singing all her life, but she enjoyed it too much to think she could make any real money at it. Billie Holiday sang, and when she was through, the little club was

completely quiet. She got the job, and one of the greatest careers in jazz history was launched.

Lady Day is a nickname; it is short for Billie Holiday, which is the professional name of one Eleanora Fagan. Even hardened critics agree that Lady Day is someone with more than just a good voice; she has the rare ability to inject sincere feeling into a lyric and turn a lifeless sheet of music into something warm, and human, and real. *Lady Sings the Blues* is the autobiography of Billie Holiday; in many ways it is more than a historical account of the rise of a great jazz personality. It stands also as shocking evidence of the cruelty of a well-known force in America. The name of the force is Jim Crow.

Written in collaboration with William Dufty, her book has many sections that appear to be taken from tape-recorded interviews with Miss Holiday. Perhaps this is the explanation for the frank and often profane narration. Lady Day has left nothing to the reader's imagination; she lashes out freely and with no inhibitions, against the people and places and conditions that contributed to her battle against poverty, racial prejudice, and finally, narcotics. She tells boldly of her tragic childhood: "Mom and Pop were just a couple of kids when they got married. He was eighteen, she was sixteen, and I was three."

Shifted from relative to relative while her mother labored to earn enough money to set up a home for herself and her daughter (Clarence Holiday had long since become the proverbial errant musician), Billie worked twelve hours a day scrubbing the white people's steps from one end of Baltimore to the other when she was only six. At ten, following a brutal attack by a forty-year-old man, she was taken into custody and placed in a Catholic institution where, among other punishments, she was locked up for the night with the body of a dead girl. A rebellious spirit coupled with an iron constitution pulled her through that experience, which has haunted her during most of her adult life. By the time she was fifteen, Eleanora Fagan was earning her room and board by means of the oldest profession in the world. It was shortly after this last experiment that the world got a sampling of what was to become one of the greatest voices jazz has ever known.

Billie Holiday's story might well be the story of Jim Crow itself and what that kind of thing does to the human being on the receiving end. Billie tells of the time she toured the country with Count Basie and his band at the time Detroit was suffering from an epidemic of race riots. The management took one look at Billie and ordered her to wear black makeup while she appeared in Detroit. Her complexion was not dark enough, they said, and the sight of a white girl singing with a Negro band could easily set off another Jim Crow exhibition.

Getting three meals a day, and sometimes even a place to sleep, became a regular production when Billie toured with the Artie Shaw organization a few years later. She became so accustomed to the insults hurled at her by

white "crackers" (Negro term for racist) that she often remained perfectly calm while Shaw and his band fought valiantly but in vain for her rights as a human being and an American.

Exactly when Billie Holiday became addicted to narcotics is not made clear, for after her initiation as a night-club performer when she was fifteen, the book forsakes chronological order and becomes a series of incidents arranged in no particular order. The story of her arrest and subsequent imprisonment are vividly dealt with, and she does not hesitate to attack America's treatment of the dope problem. She takes full advantage of her own notoriety as an addict to put across a number of sound ideas, which alert legislators might do well to study.

Lady Sings the Blues is not well written; it is full of language which would cause English instructors to shudder, but the book is by no means cheap. It is a sincere effort to present the life of a great talent and an outstanding personality as it was lived. No names have been changed to protect anybody, and many chapters are peppered with incidents involving well-known personages who influenced Lady Day in one way or another.

People to whom the name Billie Holiday means little more than a vaguely-remembered headline of some years ago now have an opportunity to discover why she has been called the greatest jazz singer of the era and why grown men and women are often moved to tears when *Lady Sings the Blues*.

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On The Grass Harp — by Truman Capote

REGINALD KOOISTRA
Rhetoric 101, Theme 8

THE DEVELOPMENT OF A PHILOSOPHY TO LIVE BY involves the consideration of all people and all ideas. If it is a good philosophy, it will include all of the segments of life and will supply a frame of reference to judge them by. If the philosophy is not quite so good, its application may require the rejection of certain elements of life which, in reality, have always existed and will probably continue to exist.

I consider my own philosophy of life to be a good one, since it supplies an extremely accurate map of a large portion of the geography of humanity. There is, however, an area which I have purposely left unexplored. This region is inhabited by the artists, the musicians, and the writers.

By subjecting them to my "scientific analysis" of life, I would destroy a great deal of life's meaning. Judging art by the use of science is as stupid and

crass as judging science by the use of art. In a multitude of ways, the two are incompatible.

An admission of this fact, however, results in a philosophical bisection of the universe. The world is reduced to physical or spiritual things, tangible or intangible, man or God. By setting the artist apart from the scientist, we imply that we are setting them against one another. While I am certain that I will never question the artist, I have always questioned my own right to shelter him from the cold, mechanical attack of a new type of thought.

To a certain degree, *The Grass Harp* clarified the problem for me. It was not because the book itself contained the answer, but because it revealed to me in a negative manner the correct definition of love and beauty.

In *The Grass Harp*, love is retrospective: all of the things it could have been and all of the things it should have been. The book illustrates clearly how ridiculous it is to try to live on memories, but it shows even more clearly the futility of trying to escape the "surface qualities" of life in favor of something "higher" or "more pure." Love, in its truest sense, must be directed toward what *is*, not toward what *should be*, and the artist who lives on dreams instead of the hard texture of reality is disillusioned. He never accomplishes anything, simply because he is never in contact with the materials which he needs to fabricate something of value. Life must be lived, not just observed; it should be regarded as an exploration, not an obstacle course.

It is to be admitted that life is nothing but problems to solve. Life's pleasure, however, should come from the act of solving these problems, not from knowing that we have them solved.

The incompatibility between the scientific attitude and the artistic temperament no longer exists in my own mind. The artist is in search of life; the scientist is in search of life. The artist asks why; the scientist simply asks how. The artist is a scientist, an imaginative scientist who is not hemmed in by the walls of facts and statistics. He is free to explore the unknown. The reason that there are truths in art which defy the analysis of science is that the artist has catapulted farther ahead in his exploration of life. He is the advance scout of science.

Truman Capote's novel fails because its characters succeed. Love is life. In their search for love, however, the characters of *The Grass Harp* seem to disregard life altogether and proceed to search for something "higher" and "more pure." The book puts the very idea of love on a pedestal and seems to say that, although we must live on the contemptible level of life, we may look up for hope at the shining ideal. The main trouble with Capote's book is that it yearns for the past and hopes for tomorrow, without a shred of consideration for today.

The Grass Harp seems to be nothing more than a convenient formula for converting love to tragedy. We are asked to accept the two, not as reciprocals but as equivalents, and this, along with the fantastic plot, gives the book a fairy tale quality. Fairy tales are never taken seriously.

"Now Kiddies, Tell Mommy to Buy . . ."

SUSAN MITCHELL
Rhetoric 102, Theme 6

IT IS A KNOWN FACT THAT THE KIDDIES OF TODAY SPEND the majority of their time in front of the television set. Unlike their skeptical elders, these cherubs absorb all of the commercials as well as the program. Naturally, this very young generation are influenced by the commercials or advertisements they see. As everyone knows, the youngsters subtly "rule the roost"; therefore, as is expected, the whole family feels the strength of the TV commercial and is compelled to obey the advertiser's every command.

In my family, this situation is serious—and all our trouble may be traced to my two young sisters and a TV set. To illustrate, I'd like to give you an idea of a typical breakfast with the Mitchell family.

Orange juice has become extinct at our house ever since a fast-talking salesman named Howdy Doody sold his small subjects on Welch's Grape Juice. Needless to say, we drink to Howdy's health every morning and hope he'll soon get an orange juice sponsor. After downing Howdy's favorite grape juice, we start on the main course, which is Wild Bill Hickok's favorite cereal. This we eat enthusiastically in the hope that we too will soon be strong, and fast on the draw (unless we develop diabetes first from this overly sugar-coated cereal). The toast is next. It is made from Bunny Bread—the bread recommended by Crusader Rabbit. Crusader would be proud to know that we all have the "rabbit habit," and, what is more important, that my sisters have completed their first collection of Crusader's pictures which are found in every loaf of Bunny Bread. Then after finishing the prescribed breakfast, there is another treat in store for us—Winkie Dink's favorite toothpaste. We brush our teeth in resigned silence, ignoring Daddy's comments about that "blasted toothpaste" which is nothing but "flavored putty!"

It is useless to rebel, for my sisters calmly announce that they will use the products they want or none at all. Their TV friends' words are final!

In addition to forcing Mommy to buy the favored products, the American TV-minded youngster spends a great deal of time singing the merits of advertised products. I feel very sad when I hear beloved old nursery rhymes such as "Little Bo Peep" replaced by "You'll wonder where the yellow went when you brush your teeth with Pepsodent" or "Humpty-Dumpty sat on a wall" replaced by "Light up a Lucky, it's light-up time."

I became strongly aware of this situation last week when I visited with a

friend who is the mother of a four-year-old named Cindy. I hadn't been there ten minutes when the proud mother announced that Cindy had learned a new verse to "To Look Sharp." I soon discovered that she knew the verses to not only that commercial but almost every commercial that appeared on television. This talented child sang out with gusto on everything from "Halo everybody, Halo" to "Falstaff beer is the right beer, yessirree." Advertisers should appreciate all the free "plugs" they get from the kiddies.

Whether or not the television commercial's influence on kiddies is good or bad, it is obviously effective. This is shown by the fact that the kiddies urge Mommy to buy the products their TV idols recommend, and the fact that they learn and sing the advertisements. It is startling to us as potential parents to realize that someday the products we buy will be determined by the heroes and heroines of the channels.

edX

Public Enemy

BARBARA ENGLISH

Rhetoric 102, Theme 7

J. EDGAR HOOVER AND THE FEDERAL BUREAU OF INVESTIGATION deserve and receive congratulations for capturing and bringing to trial many of the country's Number One Public Enemies. The greatest enemy of our nation, however, cannot be handcuffed, tried, and put behind prison bars. Our greatest enemy is not a gun-crazed criminal, but the abstract quality of nearsightedness.

Our nearsightedness makes us indifferent to events and ideas that are really most important. We are driven to keep busy whether we accomplish anything or not, and we emphasize the superficial. Meetings, daily duties, immediate assignments blot out a broad, searching view of our surroundings, and our depth of perception is blocked by selfish interests.

Nearsightedness prohibits our being interested in current events and world problems. It abets our misunderstanding the Britisher, the Nigerian, the Korean, the Southerner. It leads to an attitude of apathy toward conditions we should be combatting and ideas we should be considering.

Because of nearsightedness we have enthroned "the newest," and "the latest model," and "the biggest." Our nearsightedness has let us permit the good to get in the way of the best, and the relatively unimportant immediate duties to come before the long-range essentials.

edX

Preparation for Adventure

DONALD R. EDWARDS

Rhetoric 101, Theme 5

THE LAST FRONTIER ON THIS WIDE EARTH FOR THE explorer at heart is the underwater world. To be witness to this strange new world, a person must first learn to adapt himself to the physical differences in the underwater atmosphere. Some people jump headlong into the sport; it is safer to go feet first.

The ignorant enthusiast straps on a SCUBA (self-contained underwater breathing apparatus) and jumps in. Often his epitaph shows that his last words were, "Hey, look at me: man from Mars!" If he doesn't drown, he may rupture his lungs, or get the "bends" (bubbles of carbon dioxide in the blood), or he may just come struggling back to the boat completely exhausted after being underwater for only five minutes. The fool never bothered to find out that the SCUBA is a highly complicated, and sometimes temperamental, piece of equipment. It is the drowned man that makes the next of kin cry the loudest and give the sport a bad name, calling it dangerous. If the kin only knew that their loved one committed suicide because he did not bother to learn decompression tables, rates of ascent, emergency measures, and a host of other things before he took his first "lung dive"! But now let us look at the preparation which the wise man makes, for it is he who will tell stories of the wonderful experiences in this new dimension.

The wise man spends a winter or spring at the local YMCA pool with a face mask, flippers, and a snorkel tube, before he even looks at an aqua-lung. Let us watch this person as he instructs himself in the use of this simple equipment, and we will see that the sport demands certain basic experience. We shall call the novice George Grunt.

Now, George realizes that he must become proficient in four things: controlled breathing, the emptying of the face mask of water while underwater, the use of the flippers (webbed feet), and the equalization of pressure in the middle ear. So, he takes his mask, flippers, and snorkel tube into the pool, and for a few weeks he places his entire concentration on learning how to breathe correctly. George places himself on his stomach and paddles the flippers just enough to keep him afloat. He begins by taking a quick, deep breath and holding it as long as possible with his face down in the water. Then he forcibly exhales through the snorkel to blow out any water that may have seeped into it and takes another quick, deep breath of air, repeating the cycle. Often, while he is taking a breath, he is choked by water that enters the tube. But George is wise, and he knows that he must not panic and spit the tube out, for it is his life-line. Exerting his will over his instinct, he calms himself; he gives a hard blow with the air still left in his lungs, and then he attempts to breathe again. Soon this type of breathing becomes second nature to George. Now he is ready to learn how to clear his face mask.

The face mask is of the type that does not have built-in snorkel tubes, and it covers only his eyes and nose. George begins by standing in the shallow water. He fills the mask with water and applies it to his face. Of course, he has already overcome the fear of getting a little water in his nose. He then falls backward into the water, and, while holding the mask to his head, he exhales through his nose. The bubbles rise to the top of the mask and force the water out.

George finds mastery of the flippers very easy. He soon learns that a half-hearted kick and a long glide are the least tiring. The method of getting propulsion is something like that of a leisurely bicycle ride.

George has left the hardest task for last. He finds that when he dives to the bottom of the pool, there is a terrific pain from the pressure on his ears. While down there, he takes his face mask off, holds his nose tightly with his fingers, and attempts to exhale forcefully through his nose. This equalizes the pressure in the middle ear with the pressure of the water, and George finds that he can hear every splash on the surface. Soon he learns that he can perform this equalization without taking his face mask off.

George has become proficient in the use of his accessory equipment, and he continues his preparation for adventure by plunging into the more technical aspects of the sport: the physiology and mechanics of SCUBA diving. He purchases a recommended handbook such as *Underwater Safety*, by E. R. Cross, and he studies the decompression tables, depth charts, rates of ascent, and other important items, until he has them mastered.

When the summer comes, George's preparations will be complete, and he will be ready to safely experience a new feeling: a feeling of exaltation in being free from the bonds of gravity. J. Y. Costeau, world-famous diver and oceanographer, in his article "Menfish" (an account of his first experience with an aqua-lung), describes it:

To halt and hang attached to nothing, no lines or air pipe to the surface, was a dream . . . From this day forward we would swim across miles of country no man had known, free and level, with our flesh feeling what the fish scales know.



Escape from Reality

ROBERT SMOOT

Rhetoric 101, Theme 5

ONE OF THE MOST BEAUTIFUL SIGHTS IN THE WORLD IS the reflection of light in a subterranean cavern. The crystalline minerals are prismatic and reflect ordinary light rays as a myriad of colors—tints and shades of red, white, blue, yellow, and all their tones. The awesome play of light in a cave is accompanied by the rhythmic sound of dripping water as it sculpts and creates weird mineral formations. The echoes of this endless sound create an eerie harmony that, despite its weirdness, pervades the

soul with an inexplicable peacefulness. One frequently finds, after visiting a cave, that he asks himself, "Just what is a cave? What has caused such strange beauty and harmony?"

The tremendous force exerted by such natural agencies as air, water, and volcanic action has carved interesting chambers in the earth's crust. These chambers are called caves; they can be divided into several groups according to their method of formation—those formed by the action of air, those formed by the action of water, and those formed by the action of volcanoes or similar subterranean forces.

The solvent action of water has created the greatest number of caves. The continual friction of water in underground streams has resulted in the formation of huge, subterranean grottos in the solid rock. Caves often occur in limestone, since, of the more common rocks, limestone is most easily dissolved in ground water containing carbon dioxide. The Mammoth Cave of Kentucky, the Luray Cavern of Virginia, and the Matlock Grotto of Derbyshire are famous examples of this type of cave. Lining the walls of these caverns is a calcareous incrustation which reflects light in such a manner as to give the caves a strange, lustrous beauty. Apparently supporting the vaulted ceiling are pillars of stone called stalactites and stalagmites, peculiar growths of minerals which are deposited by water as it seeps through the top of the cave.

Oceans play a great part in the erosion of stone and the formation of caves. One can find numerous sea caves on almost any rocky coastline. These tunnels into the earth slant upward and are the result of the undermining of the cliffs by the grinding action of ocean water with its load of grit and sand. As huge ocean waves smash into the mouths of sea caves, air is compressed and driven into every fissure and crack in the cavern. Upon the sudden withdrawal of the pressure as the water runs out, the air expands, aiding the growth of the cave by ripping loose showers of fragments. Many sea caves continue to increase in depth until they emerge at the surface, forming "blow-holes" or "spouting horns" which send up white puffs of spray with every incoming wave during a storm.

In inland cliffs which are composed of alternate layers of hard and soft stone, the softer layers of stone are more easily eroded by the wind and by changes in temperature than are the harder layers. Eventually the wearing down of the softer layers results in the formation of shallow caves.

Large lava caves are to be found in Iceland and in the Hawaiian Islands. These caves, characteristic of volcanic regions, are formed as a result of the escape of molten stone from the lava flows, after the formation of a hard crust. Huge vacant areas beneath the earth's surface are formed when the upheaval caused by a volcano disrupts the strata there.

In the dawn of civilization, primitive man found shelter from the inclement world by inhabiting caves. He must have been awed by the strange beauty which the light of his fires enabled him to see. With the aid of a good light, man can still escape the trials and frustrations of life (if only briefly) by stepping into a cave and letting his natural curiosity and appreciation of beauty inspire his thoughts.

The Runaway Nose

FIELDER G. DOWDING

Rhetoric 101, Theme 5

DRIP, DRIP, DRIP! I FEEL LIKE A LEAKY FAUCET. DAY and night, summer and winter, I am troubled by a nose gone wild. The doctor described my case as asthma provoked by an allergy.

In the spring, a young man's fancy turns to thoughts of love. In this respect, I am no different from other men my age, but the springtime is the time of pollination for the grasses and trees. I am quite allergic to the pollen of grasses and trees. During the other months I have only yeasts, molds, house dusts, and cat's fur to breathe. When the springtime arrives though, my nose really goes all out to make me miserable.

Many times I wish I could trade my nose in on a new model, but the resale value of asthmatic noses is so low that I would never be able to get a satisfactory bargain. I could live inside an oxygen tent or wear a gas mask all the time, but I would miss so much of life that it would not be worthwhile. It has been suggested that I stop breathing. The fellow who suggested such a measure has never been a great friend of mine, and I suspect an ulterior motive.

Many people have seen me blow my nose with a large red handkerchief. To these healthy, clear-headed people it may seem funny, but to me it is a necessity. I could carry two or three normal-sized white handkerchiefs, but I would also need an extra pocket to put the used ones in. I have been called an alcoholic because of my bulbous red nose and my bloodshot eyes. The symptoms may be the same, but the cause is different. Lack of sleep and a running nose give the impression that I am an alcoholic in the last stages. The running nose keeps me awake and lack of sleep keeps my nose running. This is an eternal circle which has me in a dither from day to day.

A short while ago I had one highly embarrassing experience because of my allergy shots. These shots build up an immunity to the different things which set off the asthma reaction. One night I was in the process of taking my weekly shots while playing a game with a friend of mine. Just as I lost several points and mentioned the fact, another fellow in the house walked in. He stared at the syringe in my hand; then he glanced at the score card. The poor chap was under the false impression that I had lost the game and was paying off by injecting air into my veins. He leaped across the room and snatched the syringe out of my hand. "This can't go on!" he cried. "Don't you know gambling is not allowed in the house?"

Taking pills is another little action which sometimes causes laughter. I can never find the bottle when I need a pill, and the bottle is always popping up when I do not need a pill. There seems to be no solution to the problem of where to put the pill bottle where it will be handy and yet out of the way.

No matter what time of year, the pollen season or not, I am bothered by face powder and perfume. My nose is naturally sensitive, and all the more so when it is not clogged up and running. I have had to ask several young ladies to remove their face powder so that I would not sneeze when I danced with them. Situations which were less embarrassing than this have interfered with courtships.

I think that I have all my problems solved now. I met a young lady of my age who is also troubled by asthma. I have found that her companionship is quite enjoyable to me. She understands my misery, and she has yet to wear face powder. Although I may have once been destined to be a bachelor for life, there is a strong chance that I may become one of the many pinned men on campus, even though I carry a big red handkerchief, take pills and shots, and sneeze when I come in contact with face powder.



What to Look for in Buying an Electric Organ

ALFRED W. BLATTER
Rhetoric 101, Theme 6

SINCE A PATENT WAS ISSUED TO LAURENS HAMMOND IN 1933 for his electronic musical instrument, there has been much interest shown in devices known as electronic organs, which reproduce the tones of a pipe organ synthetically. Although these electrical substitutes are not exact imitations, their popularity has grown because they take up less space and cost but a fraction of the price of a pipe organ. The fact is that many people today own electronic organs who never dreamed of owning an organ ten years ago. Indeed, these electrical instruments have made quite an impression upon the musical public, and because of this I feel that it may be useful to describe the basic types of electronic organs and their advantages and disadvantages.

The simplest type is known as the electro-reed organ. This instrument is very similar to the old parlor reed organ which was popular at the beginning of the century, but the modern version picks up the reed tones through a sensitive vibrator and amplifies them through a speaker system. This method is employed in the Wurlitzer and Minshall organs.

These organs are mechanically very simple and are easily repaired, but they lack variety in tone colors. An organ of this type is excellent for a small home, Sunday-school room, chapel, or funeral parlor, where organ quality is desired.

The second major electronic organ is actually more mechanical than electronic. However, since it is the design patented by Mr. Hammond and possibly the most popular of all types, I shall discuss it along with the truly electronic types. The Hammond organ uses rotating gears which run at a constant speed. Each of the gears is fixed between two electro-magnets which set up a field. The gears are each of a particular size, so as to cut through its magnetic field at a rate which produces a tone of particular pitch. This tone is then mixed with other tones of different pitches to produce a complex harmonic pattern which is then amplified and played through a speaker. The structure of the harmonic pattern determines the tone color, and it can be controlled by the player to give many different colors, from a rich, church-like diapason to a thin, reedy oboe. However, the design of this organ is such that the harmonic pattern remains constant throughout the compass of the instrument, whereas in pipe organs the structure varies for each note. Consequently, the Hammond does not exactly reproduce organ tones.

The Hammond organ has qualities that prevent it from ever getting out of tune, and it will also take extremes in weather and humidity. For auditoriums, outdoor concerts, and traveling groups, the Hammond is the ideal instrument because of its rugged construction.

The final type of organ is the purely electronic instrument. The basic components of this organ are a number of oscillators, one for each note of the scale, and a filter network. The tones produced by the oscillators are not at all musical, but after being fed through the filters, all undesirable harmonics are removed, and the tone colors are very much like true organ tones. In fact, since the filter resonances are very much like the physical resonances in organ pipes, the tone quality is as close to the true tones as possible. This method of tone production is used in the Baldwin, Allen, Connsonata, and Organ Arts instruments.

The electronic organ is very realistic and is handled exactly like a pipe organ. However, it requires tuning more often than the other electro-organ designs. The electronic organ is best suited for concert halls, large churches, for connoisseurs of fine music.

Since the development of the electronic organ in the mid-nineteen-thirties, its popularity has greatly increased. It has made the ownership of a realistically toned organ, once a luxury for only the very rich, a real possibility for the average man. Designs have developed to suit every taste and pocketbook. I have presented a brief description of three of the major designs, along with my own comments concerning them. However, the final decision as to what type to purchase depends upon individual needs and tastes.

Problems in the Design of the Intercontinental Ballistic Missile

HARRY SAUERWEIN

Rhetoric 102, Theme 9

I. INTRODUCTION

PERHAPS YOU HAVE RUN ACROSS THE FOUR LETTERS, ICBM, in your morning paper and have wondered what they stood for.

You have seen these letters referred to as "the ultimate weapon . . . a deterrent to another war," or even "the destroyer of the world," and your curiosity has been aroused. Well, ICBM stands for Intercontinental Ballistic Missile. It is one of the new breed of weapons, called guided missiles, being brought out by the armed forces. It is meant eventually to take the place of piloted, long-range atomic bombers.¹

The ICBM differs from an artillery shell only slightly. It will be wingless, but will have its own propulsion system. Only the first stages of its flight will be guided. The ICBM follows the same elliptical trajectory that an artillery shell does, but the missile will loop into outer space, covering many miles rather than yards.²

The ICBM will be approximately 100 to 135 feet in height and will weigh between 100 and 120 tons.³ Its engines will have to develop the enormous thrust of 500,000 pounds.⁴ It will have to be in the form of a staged rocket with one fuel and engine section placed on top of another.⁵ The multiple-staged ICBM will actually be in the form of two missiles, one mounted on top of the other. The first unit or stage will fire until it has burned all its fuel and then drop away. The second stage will continue on under its own power, minus the dead weight of the first stage.⁶ The first stage will be about eighty feet tall and will house the largest engines and the most fuel. The second stage, which will not need to fire as long as the first stage, should be approximately twenty feet tall. The warhead, which will probably be thermonuclear, is thought to be thirty feet long. The entire missile will be four feet in diameter.⁷

The ICBM will be launched vertically in the manner introduced by the

¹ D. Francis, "How Strong Are Our Missiles?" *Popular Science*, CLXVII (August, 1955), 127.

² H. W. Baldwin, "ICBM," *Collier's*, CXXXVII (March 16, 1956), 75.

³ *Ibid.*, p. 76.

⁴ D. A. Anderton, "Engineers Probe Barriers to IBM Flight," *Aviation Week*, LXII (February 28, 1955), 28.

⁵ Baldwin, p. 76.

⁶ Gordon J. Vaeth, *200 Miles Up* (New York: The Ronald Press Company, 1955), p. 147.

⁷ Baldwin, p. 76.

German V-2 rockets.⁸ The missile's engines will probably be rockets. Total firing time of the rockets will be only twelve minutes, taking the second stage about 300 miles up.⁹ The missile will have reached a speed of 15,000 miles per hour, and in the last portion of its powered flight it would have tilted automatically to an angle of twenty-six degrees from the horizontal.¹⁰ The ICBM then continues on a ballistic trajectory, reaching a maximum speed of approximately 16,000 miles per hour and an altitude of 500 to 800 miles.

As it plunges down toward the earth again it will re-enter the atmosphere at an altitude of sixty to eighty miles.¹¹ The skin of the missile will begin to heat and glow red because of air friction, as it plunges on to detonate its warhead over an unsuspecting city 5,000 miles from its launching site. The entire trip from launching site to target took only thirty minutes. It can be readily seen that a weapon of this type would be a threat to any nation.

The intercontinental ballistic missile has many other advantages besides its performance. Contrary to what many people may think, the ICBM will cost less than the present strategic bombing system. After initial development costs, an ICBM will cost about one million dollars, as compared to eight million dollars for one of the Air Forces' largest bombers, the B-52.¹² Launching sites will also be much cheaper than the huge air bases required by present-day bombers.

Launching sites could possibly be made mobile and scattered about the country. An ICBM could also be easily hidden.¹³ Because of its mobility and ease of being hidden, an enemy would find it difficult to wipe out all possible launching points. The enemy could never be sure of an ICBM's location.

The missile would need few spare parts and little maintenance. After a perfected ICBM was put into production, no test flights would need to be made.¹⁴ An ICBM could be launched in any weather, at any time, and its accuracy would not be affected by weather conditions at the target.¹⁵

But the ICBM still has to be developed. Though it is in the realm of possibility, the intercontinental ballistic missile is not yet a fact. One expert has said, "The missile (an ICBM) can be built with the scientific knowledge now available, but basic research will enable us to do the job better. The work ahead is chiefly engineering."¹⁶

Three primary problems face the ICBM engineer. The problem of propulsion—finding the right fuels and engines to obtain enough thrust to send the giant missile off into space—is the first. The second problem, finding and developing an accurate guidance system, is perhaps the most difficult. The

⁸ Anderton, "Engineers Probe Barriers to IBM Rlight," p. 26.

⁹ Baldwin, p. 24.

¹⁰ R. Hotz, "Operation Missiles Now Arming U. S. A. F." *Aviation Week*, LXII (May 21, 1955), 14.

¹¹ E. Rees, "Missiles Away," *Time*, LXVII (January 30, 1956), 56.

¹² *Ibid.*

¹³ G. J. Vaeth, "Guided Missiles," *Flying*, LIII (August, 1953), 61

¹⁴ Rees, p. 56.

¹⁵ R. J. Davis, "Missiles of the Future," *Newsweek*, XXXXI (June 15, 1953), 28.

¹⁶ Baldwin, p. 76.

third troublesome problem is getting rid of the tremendous heat generated by air friction upon re-entry into the atmosphere.¹⁷

II. PROPULSION

The ICBM's rockets will have to develop huge amounts of thrust to hurtle the large missile out into space. Some people wonder how a rocket engine will operate in space, where there is no atmosphere "for the rocket to push against." Actually a rocket does not obtain its power by "pushing" on the atmosphere. The rocket engine works on an action-equals-reaction principle. Newton's third law of motion states that for every action there is an equal and opposite reaction. A rocket expels hot gases rearward (the action) and thus moves forward (the reaction). Therefore, the ICBM will not need the atmosphere for its rocket to "push against."¹⁸

There are two main types of rocket fuels, solid and liquid. Solid fuels, which are usually mixtures of gunpowder and a suitable base, have short endurance but very high thrust. They are usually used in missile-launching boosters. Solid-fuel rockets also have steady thrusts, which makes them very suitable for the initial stages of missile flight, when a slight fluctuation in thrust might mean the difference between a hit and a miss. A solid-fuel booster might be used to launch an ICBM.¹⁹

The main stages of the ICBM will utilize liquid-fuel rockets. The liquid-fuel rocket is much more complicated than the solid-fuel variety, because it requires large amounts of tubing and numerous pumps. Most liquid-fuel rockets are bipropellant, carrying an oxidizer and a fuel in separate fuel tanks. The oxidizer and the fuel are pumped under pressure by a high-speed turbine pump into the combustion chamber where they are ignited and expelled through the nozzle of the rocket.²⁰ Another disadvantage is that liquid rocket fuels are very hard to handle. They are volatile, explosive, corrosive, and must be handled with care.²¹

Another fuel which holds great promise is fissionable material. A small nuclear pile could be used to heat and expand a gas to be used in the rocket. This system is unlikely to be used on the first ICBM, but it might ultimately prove to be the most efficient system.²²

The ICBM will require at least 500,000 pounds of thrust in the initial stages of its flight. But the largest rocket engines built today develop only 120,000 pounds of thrust, so the system of having a number of engines mounted in a group, like the configuration in which the bullet chambers are arranged in

¹⁷ *Ibid.*

¹⁸ Vaeth, *200 Miles Up*, p. 137.

¹⁹ *Ibid.*, p. 138.

²⁰ *Ibid.*, p. 40.

²¹ Baldwin, p. 76.

²² *Ibid.*

a revolver, has been planned. By grouping the engines, sufficient thrust can be obtained for efficient ICBM operation.²³

III. GUIDANCE

The ICBM will be guided only when its rockets are firing, during the first 300 miles of its flight.²⁴ Because the missile is guided for only this short time, its speed and direction at the time when its rockets burn out must be precise if the missile is to hit the target. Guidance on the downward leg of its flight would be useful but would add too much weight to the missile to be practical.²⁵ Guidance, therefore, is one of the most important and difficult problems to be solved.

Several systems have been proposed to guide the ICBM. One type would have all data precalculated and fed into the ICBM's computer. At the proper time the computer would activate the missile's servomechanisms to guide it through its flight path. This is called the pre-set programmed method.²⁶ Another system, similar to the programmed method, would have the computer located on the ground at the launching site, and the missile would be kept in radio contact with the ground. This system would save the weight of the computer but would be subject to radio interference which might cause the missile to stray off course.

Much more elaborate systems of guidance are also being planned. One such system, called the terrestrial method, would have the ICBM locating its own position by means of magnetic, electrical, or gravitational fields. Under this system the ICBM would "sense" its own position and make corrections in its course.²⁷ About the most ingenious system is the inertial method. Gyroscopes and accelerometers would "feel" all forces acting on the missile and locate its position. Corrections in flight path would be made automatically.²⁸

The last system seems almost unbelievable. It is called the celestial method. Small telescopes would be located in the ICBM and set to track on a pair or series of stars. By this method the missile would actually navigate all the way to the target. This would be the system least susceptible to enemy jamming.²⁹

The complications and errors involved in the guidance of an ICBM are innumerable. For example, if the missile were a fraction of an inch off center on its launching stand, and if this error were not corrected during its flight, the ICBM would miss its target by many miles.³⁰

Errors come from three main sources: nature, instruments and maps.

²³ Anderton, "Engineers Probe Barriers to IBM Flight," p. 28.

²⁴ Baldwin, p. 76.

²⁵ Anderton, "Engineers Probe Barriers to IBM Flight," p. 26.

²⁶ Baldwin, p. 76.

²⁷ Davis, p. 28.

²⁸ Rees, p. 56.

²⁹ Davis, p. 28.

³⁰ M. Caidin, "Missile Report," *Flying*, LVII (November, 1955), 67.

Nature is not as steady and unchanging as it may seem. Gravity varies non-uniformly, and the Earth does not rotate evenly. The ionosphere varies, causing fluctuations in radio signals which are bounced off of it.³¹ All these factors would combine to make position-locating for the missile very difficult. The long, unguided range of the missile would also multiply any instrument errors at launching. An error in speed of one foot per second at launching would cause the missile to miss by one mile. Another factor which would cause difficulty is the inaccuracy of our present world maps. Some maps were found to be as much as fifty miles off during World War II. Obviously, an ICBM would miss its target if the exact location of its target was not known.³²

After the guidance system has determined when and where to execute the maneuvers of the missile, the control system will have to do the actual work of turning the ICBM. In the initial rise through the atmosphere the missile could be controlled by external vanes, much as an airplane is controlled. But above 120,000 feet these vanes would have little effect.³³ The ICBM could also be controlled by vanes in the exhaust, or by moving the entire engine to direct the exhaust in different directions.³⁴ As the missile travels through space it will not need to be controlled, but will hurtle like an artillery shell. Just before the ICBM is about to re-enter the atmosphere, it will have to be turned so that it enters nose first, or else it will tumble and may be thrown off course. Three methods for turning the missile before it re-enters the atmosphere have been suggested. The first two are similar in that they employ either a gyroscope, or a flywheel rotating at a very high speed. Gyroscopes and flywheels rotating at high speeds tend to stay aligned in the same direction in space; thus, when the ICBM needs to be turned it could be rotated automatically about these devices.³⁵ The third system would use gas jets to turn the missile. Small tanks of compressed gas could be carried in the missile, and the gas could be expelled through small jets in its side to maneuver the ICBM.³⁶ Another suggestion which has been put forward would have the missile put into a spin about its longitudinal axis to stabilize it during its entire flight. This could be done by use of any of the above systems.³⁷

IV. RE-ENTRY HEAT

The tremendous heat generated by skin friction as the missile re-enters the atmosphere is another of the major problems faced by the ICBM engineer. A meteor burns because of heat which is generated when it plunges into the

³¹ Francis, p. 218.

³² Baldwin, p. 76.

³³ Willy Ley, *Rockets, Missiles, and Space Travel* (New York: The Viking Press, 1951), p. 245.

³⁴ Vaeth, *200 Miles Up*, p. 145.

³⁵ Rees, p. 56.

³⁶ "U. S. Races for a Supermissile," *Life*, XXXX (February 27, 1956), 29.

³⁷ Alfred R. Weyl, *Guided Missiles* (London: Temple Press, 1949), p. 20.

atmosphere with great speed. The National Advisory Council on Aeronautics has stated that the skin temperature of the missile when it re-enters the atmosphere would be "sufficient to vaporize diamonds."³⁸

One method to overcome this problem is to slow down the ICBM sufficiently so that it will not overheat. The missile could be slowed down by using dive brakes such as those used on a jet plane. This method seems feasible but it may not prove effective enough to slow the missile sufficiently. Reversing the rocket engines has been suggested, but this does not seem practical because of the extra weight of fuel which would have to be carried. The missile might be made to lose one of its aerodynamic characteristics, such as making the nose blunt so that it would slow down, but this does not insure sufficient slowing.³⁹

Another method to defeat the heat problem is to make the skin of the missile thicker and just let it burn away as it plunges into the atmosphere. But this has its drawbacks. First, the thicker skin means more weight, and more weight means more fuel and larger engines, and further complications. Also, the skin may not burn away evenly, and therefore the missile may tumble off course.⁴⁰

Some scientists think that thermonuclear warheads will eliminate the need for even entering the atmosphere. They believe that the ICBM could be exploded above the atmosphere and still do sufficient damage to its target. But this is only a matter of opinion and will need further investigation.⁴¹

The last method would use a cooling process to keep the skin of the ICBM cool. A system much the same as the one the human body uses would be employed. A skin, probably ceramic, with many pores through which a liquid could be passed, would cover the missile. When the temperature rose above a safe level, liquid would pass through the pores in the skin and be evaporated. The evaporation of the liquid would keep the skin of the ICBM cool.⁴²

V. CONCLUSION

The destructive power of a thermonuclear warhead attached to an ICBM may help to solve some of the problems in its design. If the warhead could destroy a great area, the guidance system would not have to be as accurate, and the heat problem would be partially solved.⁴³ A thermonuclear blast at present would have a lethal radius of ten miles.⁴⁴ The recent realization that thermonuclear explosives would be light and handy is the reason that the

³⁸ F. V. Drake, "Guided Missiles: Key to Peace?" *Reader's Digest*, LXVIII (March, 1956), 22.

³⁹ "U. S. Races for a Supermissile," p. 26.

⁴⁰ Baldwin, p. 80.

⁴¹ Hotz, p. 15.

⁴² Lloyd Mallan, *Secrets of Space Flight* (Greenwich, Conn.: Fawcett Pub. Co., 1956), p. 110.

⁴³ Baldwin, p. 80.

⁴⁴ "U. S. Races for a Supermissile," p. 29.

ICBM has been given new emphasis.⁴⁵ The warhead of one ICBM "can carry more destructive power than was dropped by all the air forces in World War II combined."⁴⁶

With all this power and performance potential, is the ICBM as unstoppable as it is claimed to be? The answer at present is "yes." Ground fire and aircraft pursuit would be ineffective against an ICBM. The only defense seems to lie in the use of other guided missiles to intercept the ICBM.⁴⁷ For a successful interception, the ICBM would have to be detected at least 300 miles from the target and exploded at least fifty miles away. With our present rockets, this leaves only thirty seconds to fire the interceptor missiles after the detection of the ICBM.⁴⁸ But electronic counter-measures might make the ICBM very difficult to detect or intercept.⁴⁹ A defense is theoretically possible, but would take many years of development before it could be put into operation.

Perhaps the ICBM is not the ultimate weapon, but it is destined to be one of the most important and world-influencing weapons of the next few years. With the intercontinental ballistic missile, man will be able to unite the world or destroy it. Which it is to be, unification or destruction, is entirely up to mankind.

⁴⁵ Rees, p. 54.

⁴⁶ Drake, p. 17.

⁴⁷ Vaeth, "Guided Missiles," p. 61.

⁴⁸ D. A. Anderton, "Is Effective ICBM Defense Possible?" *Aviation Week*, LXIV (April 9, 1956), 46.

⁴⁹ Drake, p. 21.

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Rhet as Writ

The final thrill comes in eating the fish he caught with fried potatoes, sliced tomatoes, and a can of beer.

Everybody should be a detective in the family, that is a house detective.

Some of these buildings are being built. One, which is not, and which I am being taught in, is . . .

Fairy tails have happy endings.

Man has come a long way since Edison's kite and key had been struck by lightning.

Aside from the above factors, the college graduate is a competent lover, a sympathetic soul, and a handsome beau; thus, making him the idle of all women married and unmarried.

The average woman works until she has her first baby. This way both can reach an agreement.

I will be without a conscious for some time, as I will not be constantly reminded of an exam or quiz that is tomorrow or today.

If a person wants to have four years of great fun and doesn't plan on going to college, I advice him to attend any high school.

I felt as if I had been transplanted by some supernatural force to a new and different world.

The food is so bad here that I dumped it right into the garbage can that I had on my tray.

The danger of tornadoes is very great, as the hundreds of people killed by them every year will testify.

Money is the route to all evil.

We Would Like to Thank

all of the students who have submitted themes, many of which were worthy of publication in *The Green Caldron* but could not be included because of the physical and editorial limitations of the magazine.

—The Editors

The Contributors

Sanders R. Dolce—Mt. Prospect

Lawrence Martling—Oak Park and River Forest

Martha Ann Graves—Lyons Twp.

Quendred Wutzke Carpenter—Sandwich Twp.

Stephen P. Thomas—East Peoria Community

Joanne Ruck—New Trier Twp.

Reginald Kooistra—Rochelle

Susan Mitchell—West Frankfort

Barbara English—New Trier Twp.

Donald R. Edwards—Steinmetz

Robert Smoot—Jamaica

Fielder G. Dowding—Hinsdale

Alfred W. Blatter—Webster Groves, Mo.

Harry Sauerwein—Marissa